

SIS Football Analytics Challenge 2020

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Establishing Evaluation Metric:

EPA saved

EPA saved

- All performance will be measured in EPA saved
- Full credit (binary) if one of the following events occurs:
 - Solo sack
 - Interception
 - Fumble forced
 - Solo play defended - When player is credited with tackle within 2 yards of LOS, **and** resulting EPA is negative
 - Pass defended
- Half credit (binary) if one of the following events occurs (and Full credit == 0):
 - Assist sack
 - Pressure with negative EPA – When player is credited with pressure, **and** resulting EPA is negative
 - Assisted play defended
 - Fumble recovered

EPA saved

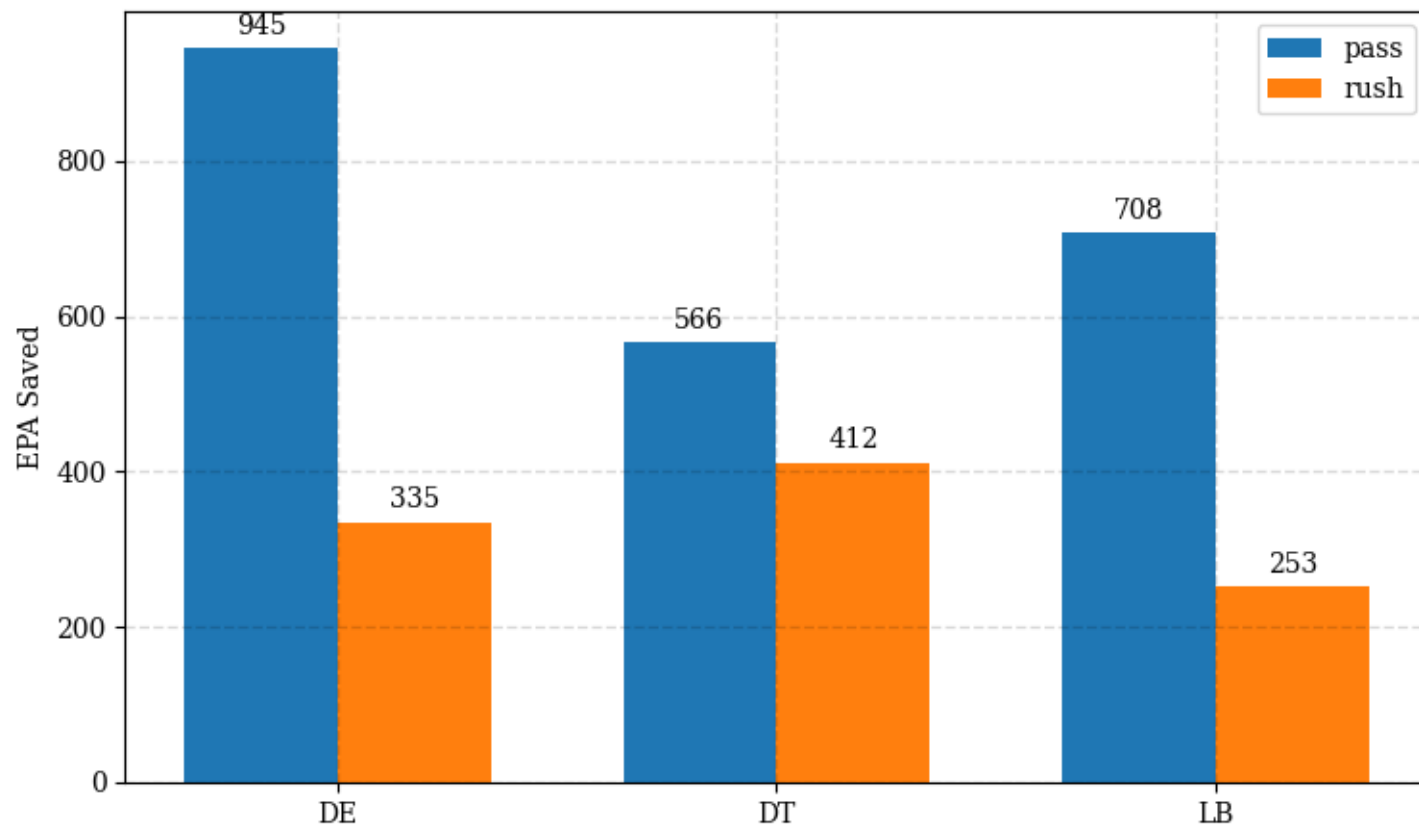
$$\text{EPA saved} = - \text{EPA} * (\text{FullCredit} + 0.5 * \text{HalfCredit})$$

- By Multiplying by -1 and calling it “EPA saved”, we avoid graphs with confusing negative values
- Note that FullCredit and HalfCredit are never both “1”

Question 1:

Which is the most valuable defensive line position?

Total EPA saved by RosterPosition and EventType

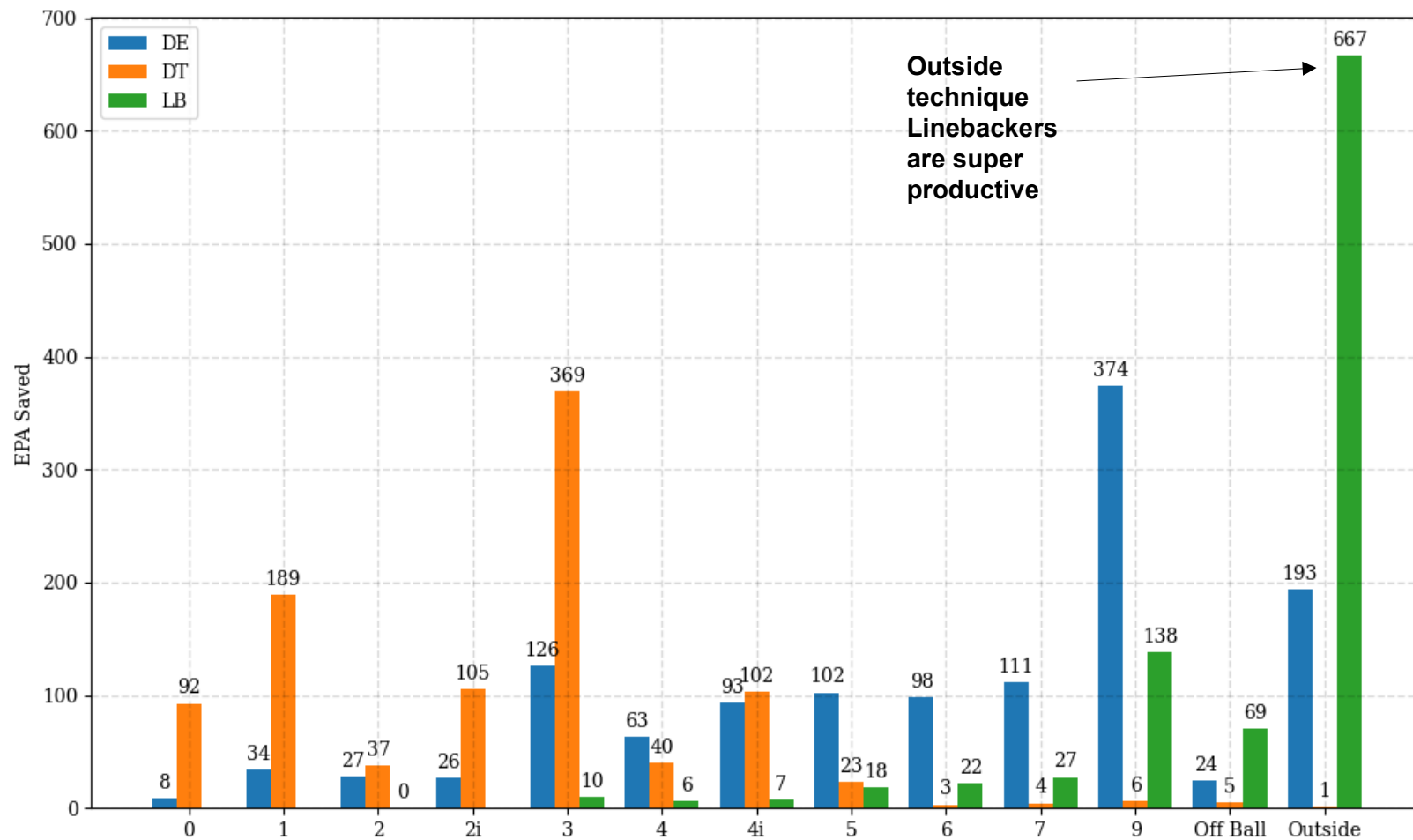


Which is the most valuable defenisve line position?

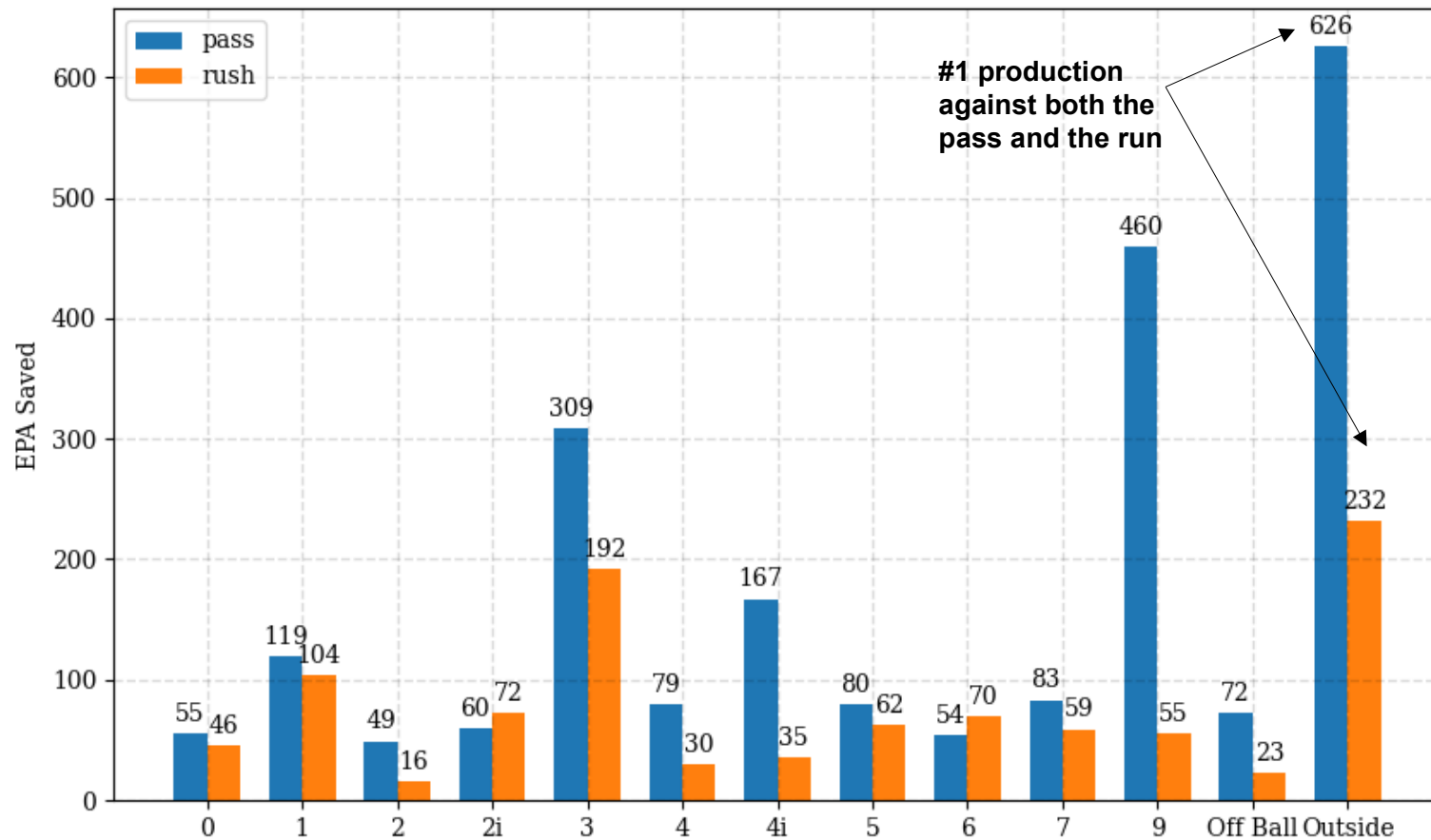
Short answer : **Defensive End**

Now, onto the long Answer

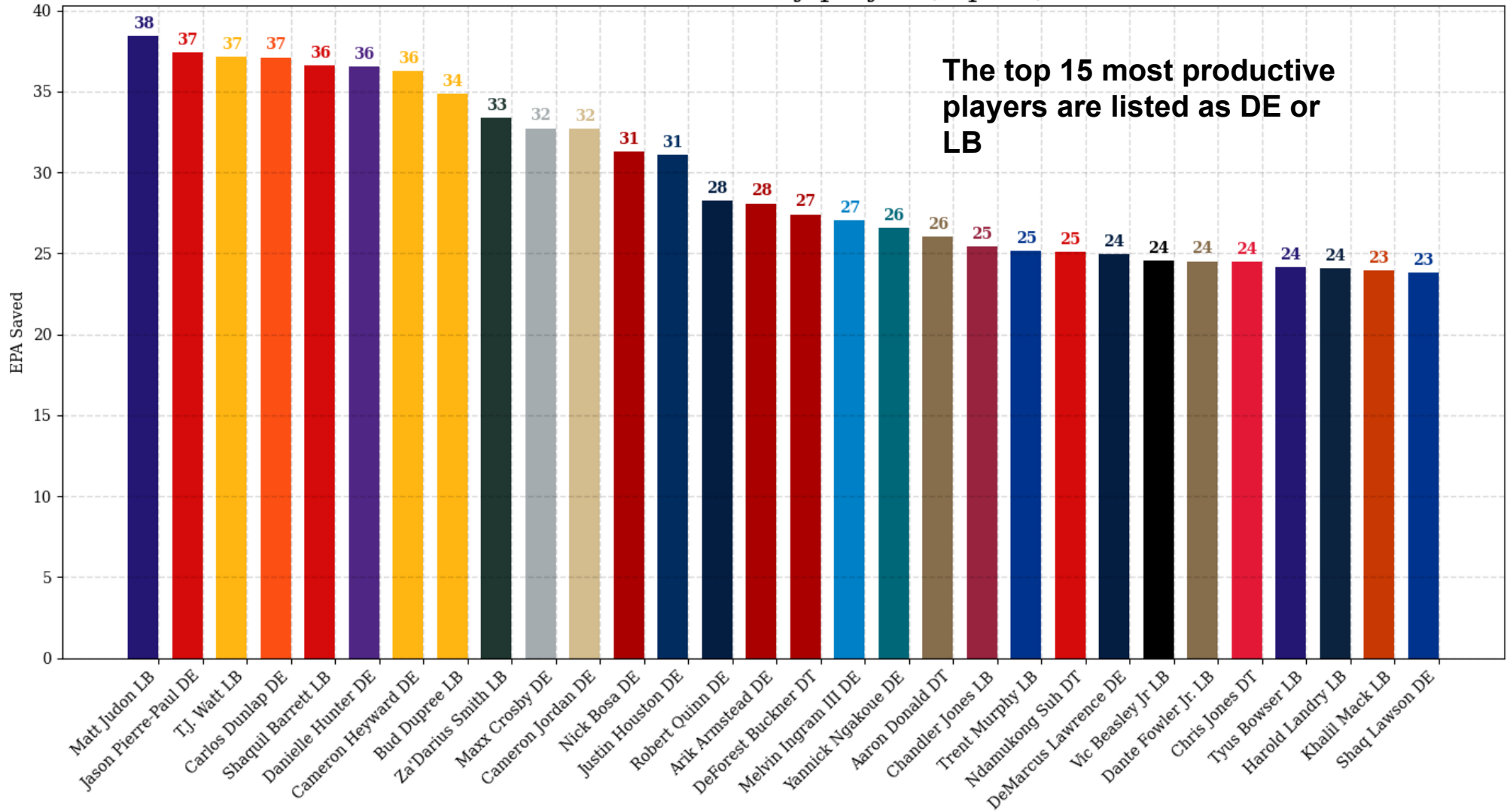
Total EPA saved by Technique and Position



Total EPA saved by Technique and EventType

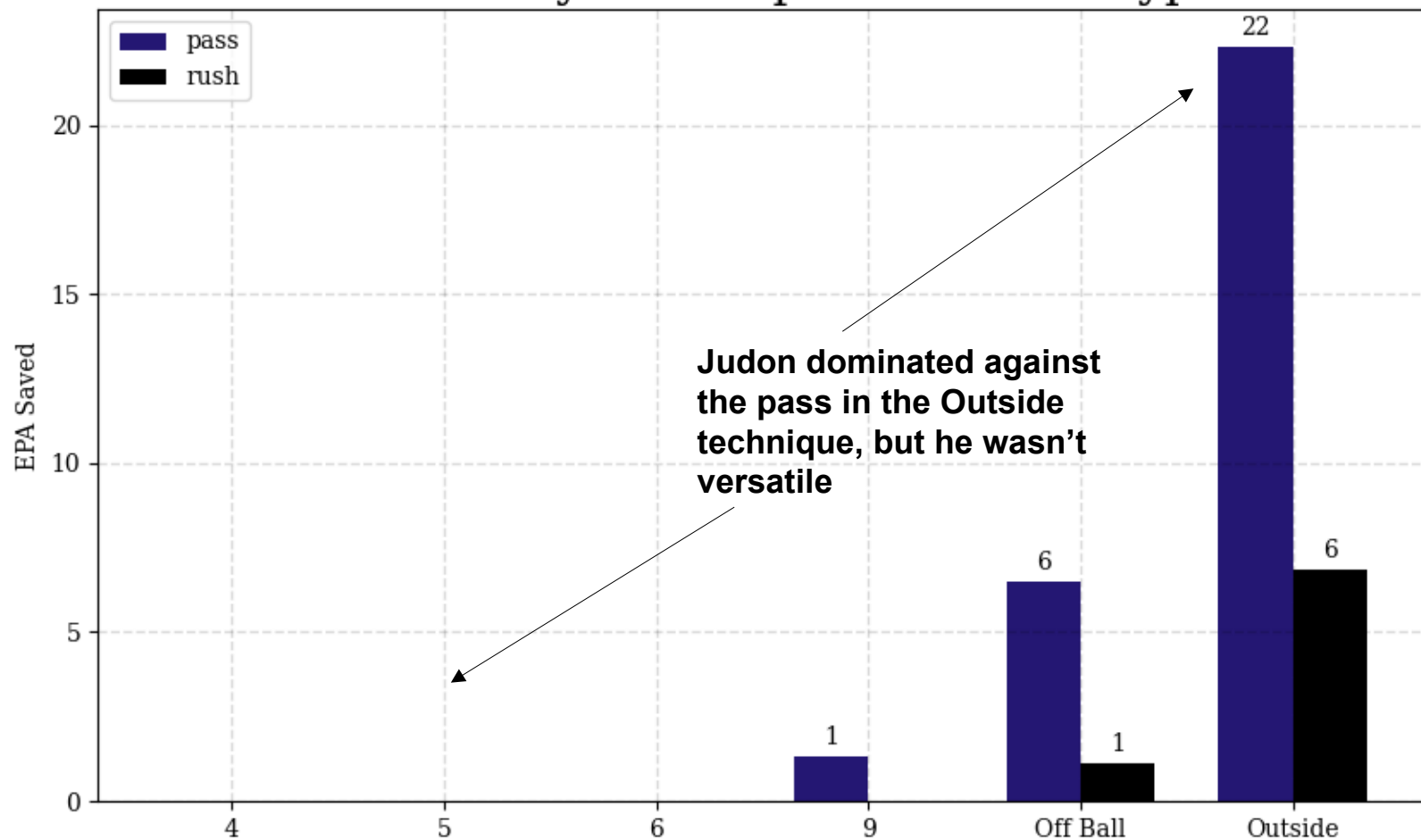


Total EPA saved by player (top 30)



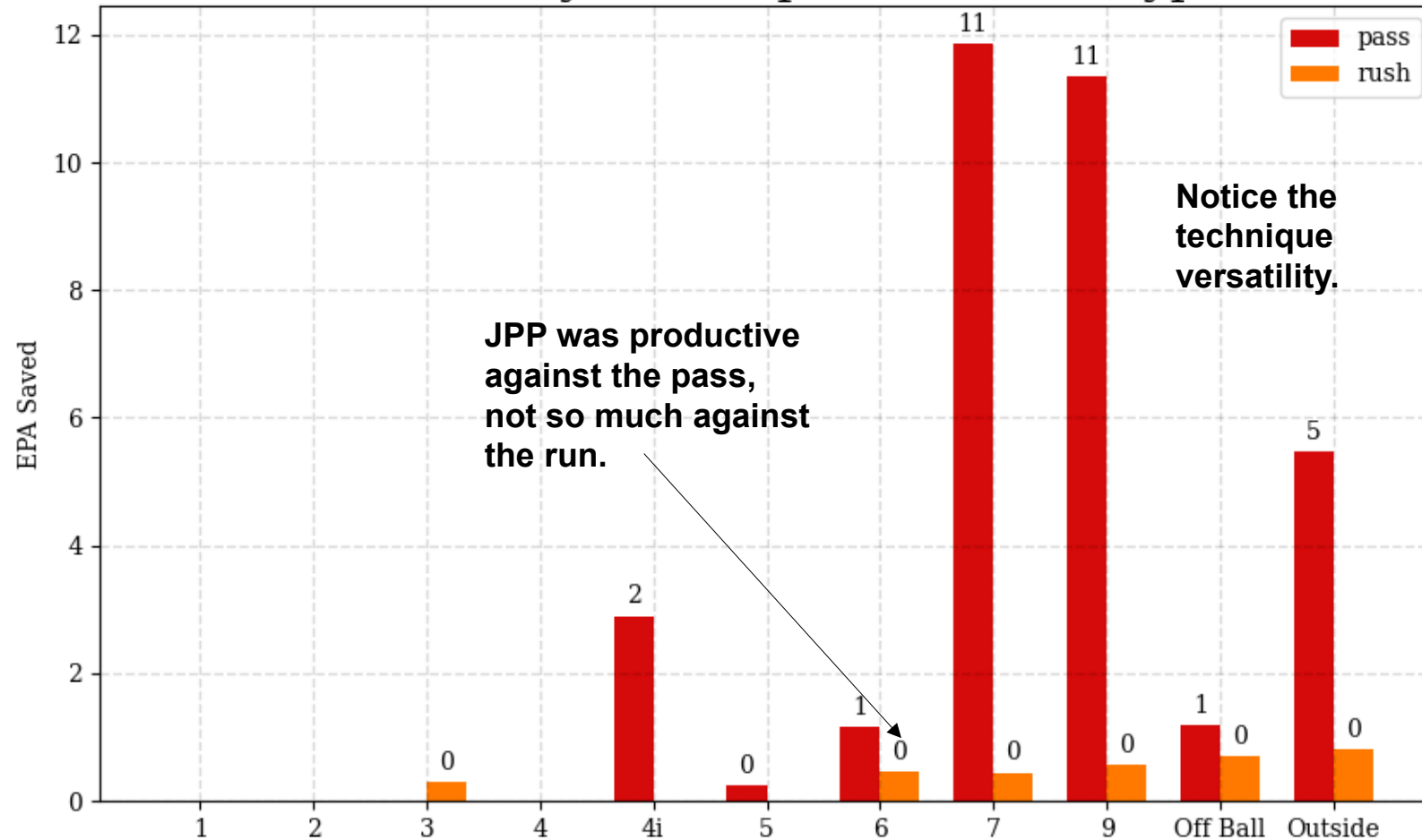
Best LB: Matt Judon

EPA saved by Technique and EventType



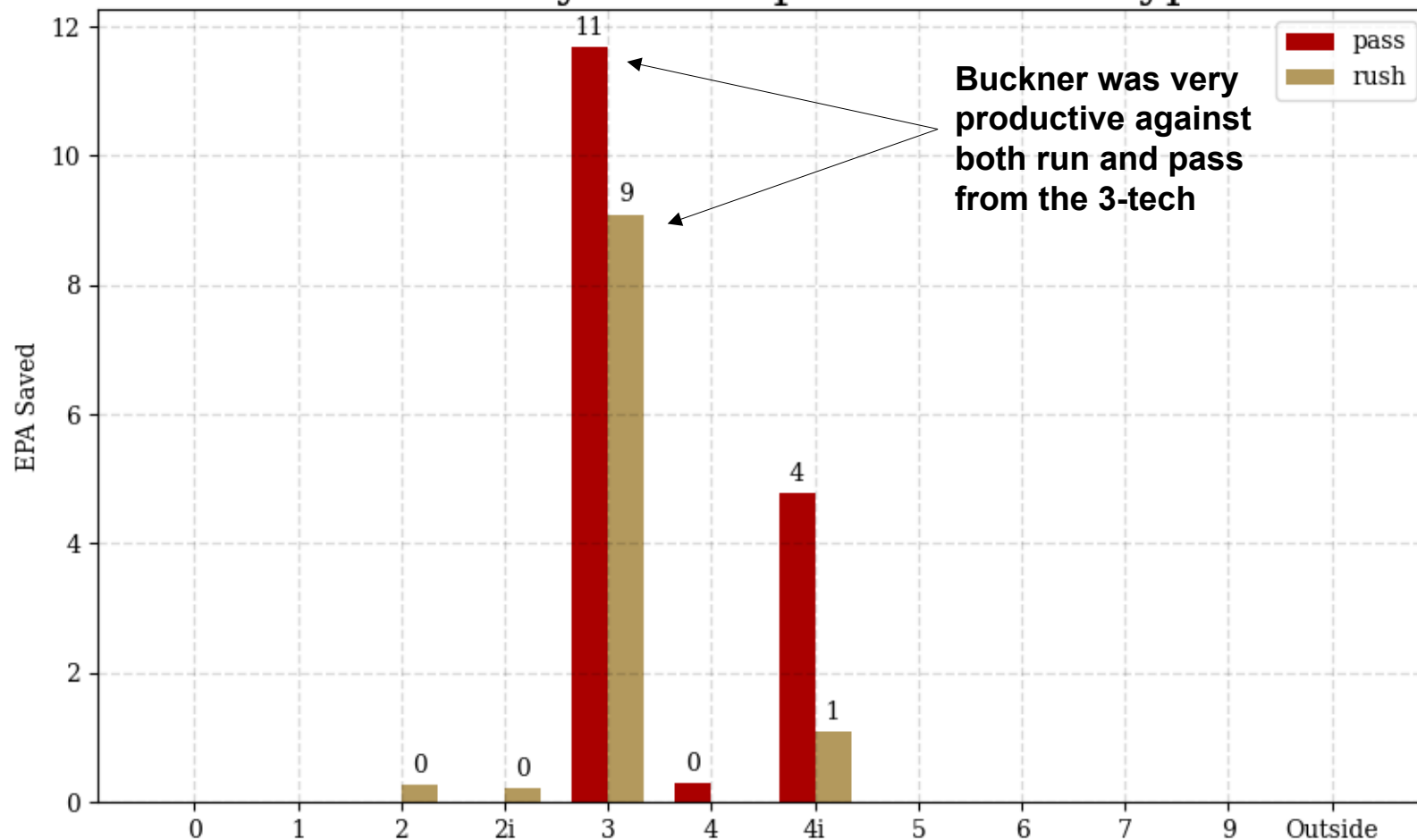
Best DE: Jason Pierre-Paul

EPA saved by Technique and EventType



Best DT: DeForest Buckner

EPA saved by Technique and EventType



Long Answer

From this study, here is how I would rank the most valuable positions:

1. 3-4 OLB / Edge / Outside LB

- **Very** productive against both **pass** and **run** (#1 EPA saved in both)
- 5 of the top 10 most productive players. ie. Judon, Watt, Dupree

2. 9-technique DE

- **Very** productive against the **pass**
- I would consider this the most versatile type of player on DL. For example, JPP was productive from 4i -> Outside techniques, even though he was predominately 7/9 technique
- 10 of the top 15 most productive players. ie. Pierre Paul, Dunlap, Hunter, Bosa

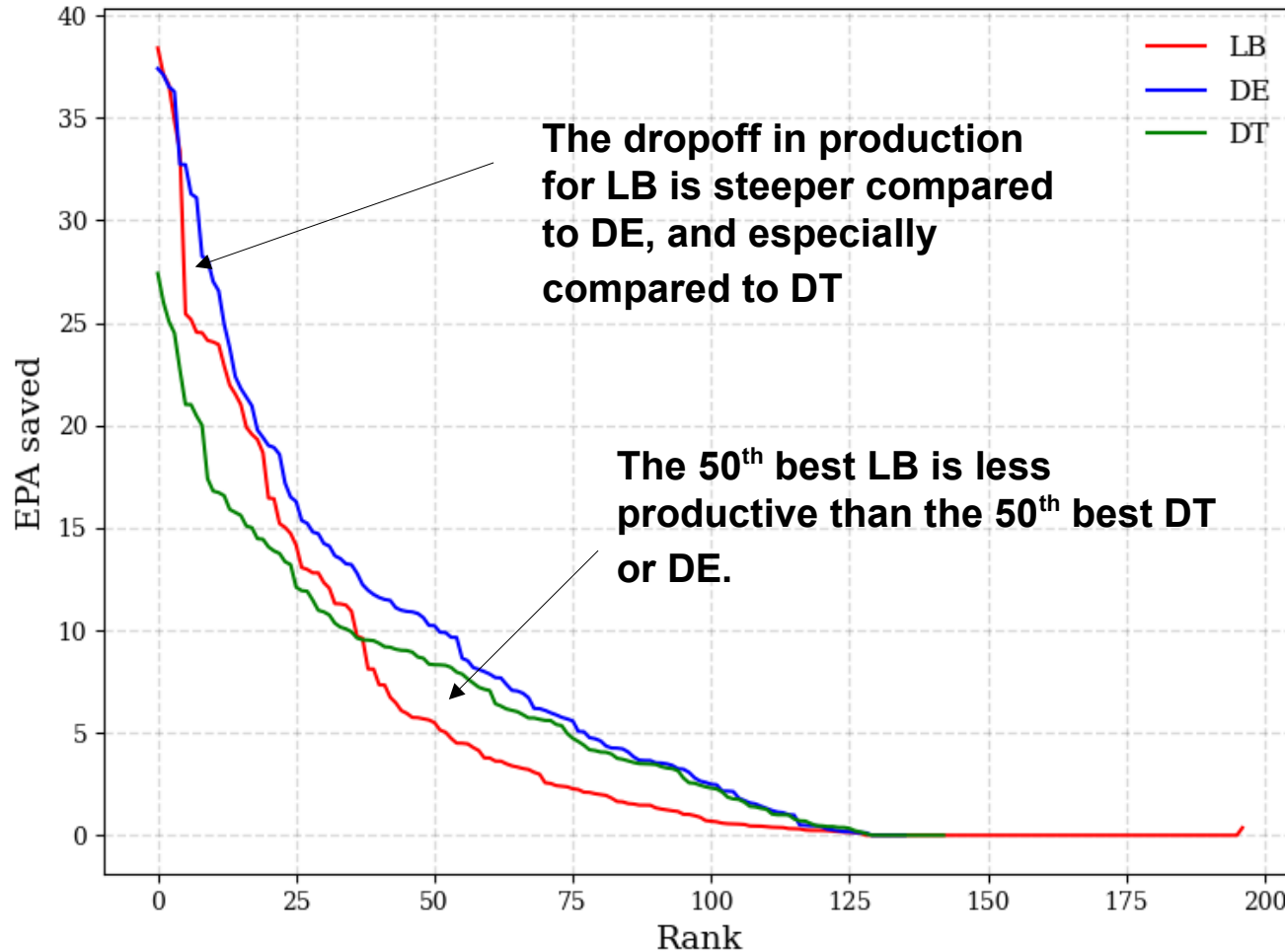
3. 3-technique DT

- Productive against the **pass** and **run**
- ie. Buckner, Donald, Suh

Question 2:

What is the nature of the distribution of talent between the defensive line positions, as you define them?

EPA saved sorted by RosterPosition



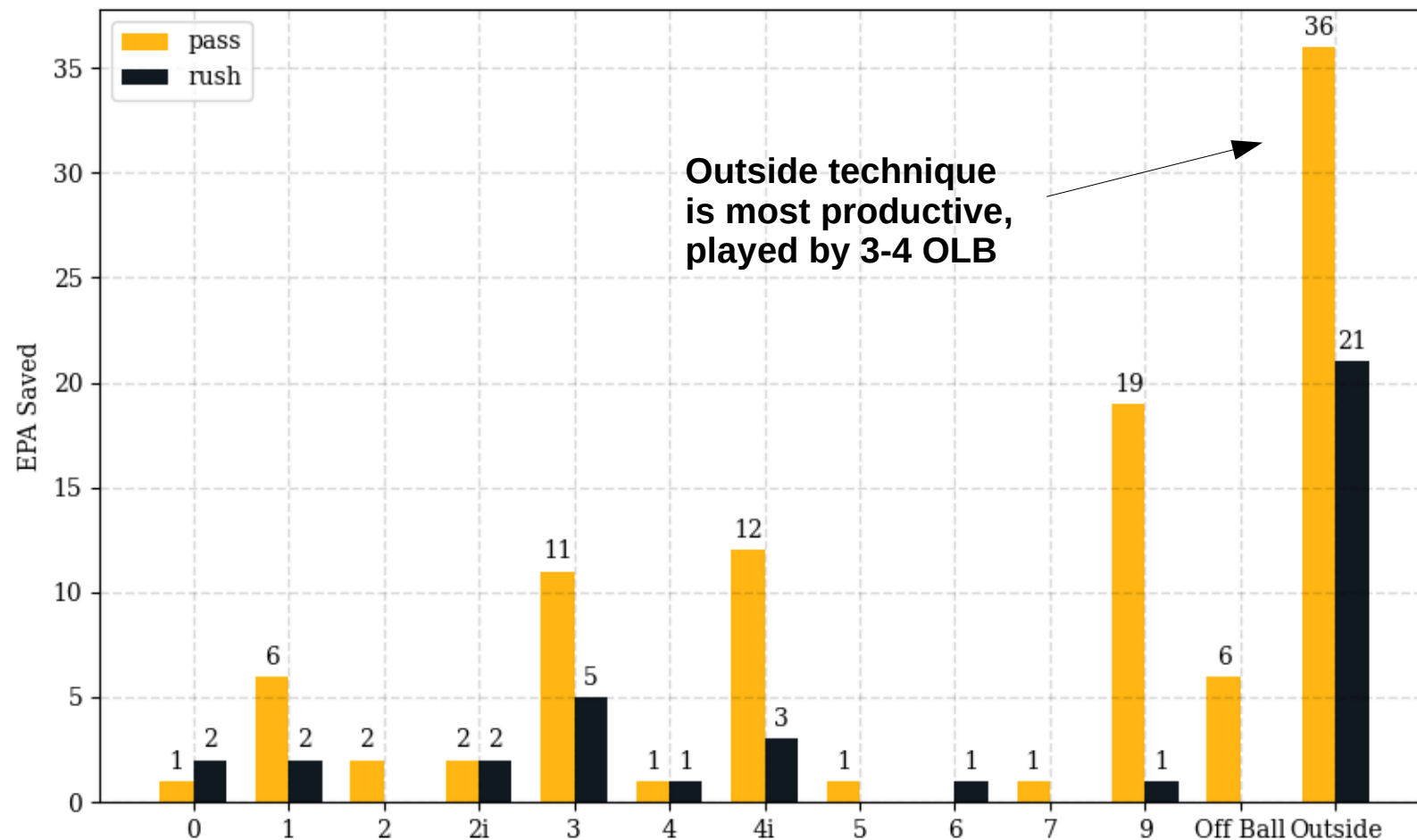
- To answer part two, the distribution of talent among LB is more top heavy compared to DE or DT. Not only are 3-4 OLBs the most productive, the elite ones are also more rare. However, in part this may be due to more teams playing 4-3 vs. 3-4
- The dropoff in talent among defensive tackles is less severe compared to the other positions.
- I will caveat this by saying that although Aaron Donald doesn't perform particular set of data, I believe that if we were given data for the past four seasons he would be near the very top in terms of EPA saved. This is an educated guess based off previous data that I've looked at (from nflscrapr)

Question 3:

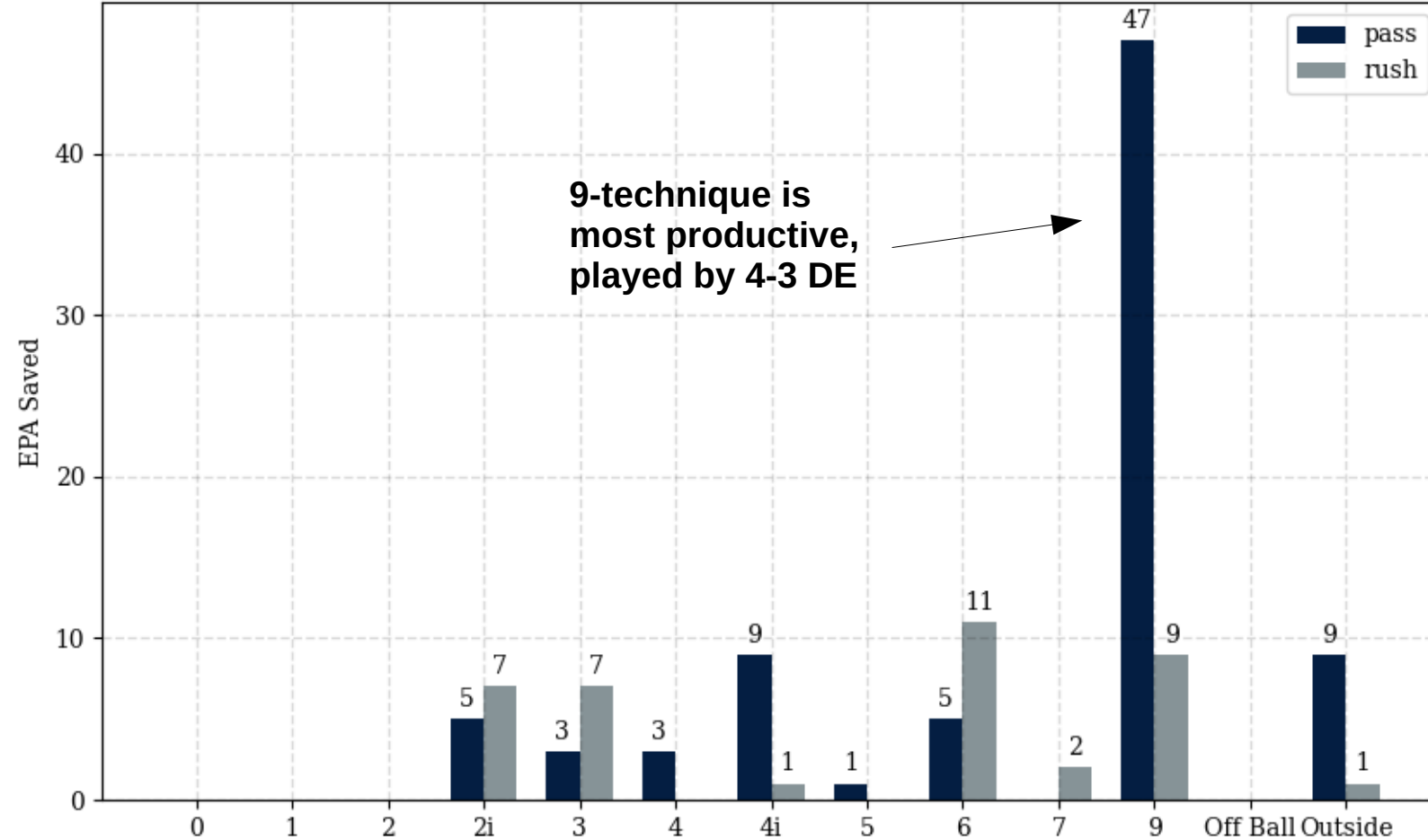
Not all situations are created equal. In which in-game or roster construction scenarios would the answer to Question 1 change?

- To answer part three of this challenge, I will state the obvious and say that if you run a 4-3 scheme, a 9-tech DE or 3-tech DT is more valuable than a 3-4 OLB
- To illustrate this, I picked the Steelers as my example of a 3-4, and the Cowboys as example of the 4-3 team. I'll show the distribution of EPA saved by technique on the next two slides

Total EPA saved by Technique and EventType: Steelers (3-4)

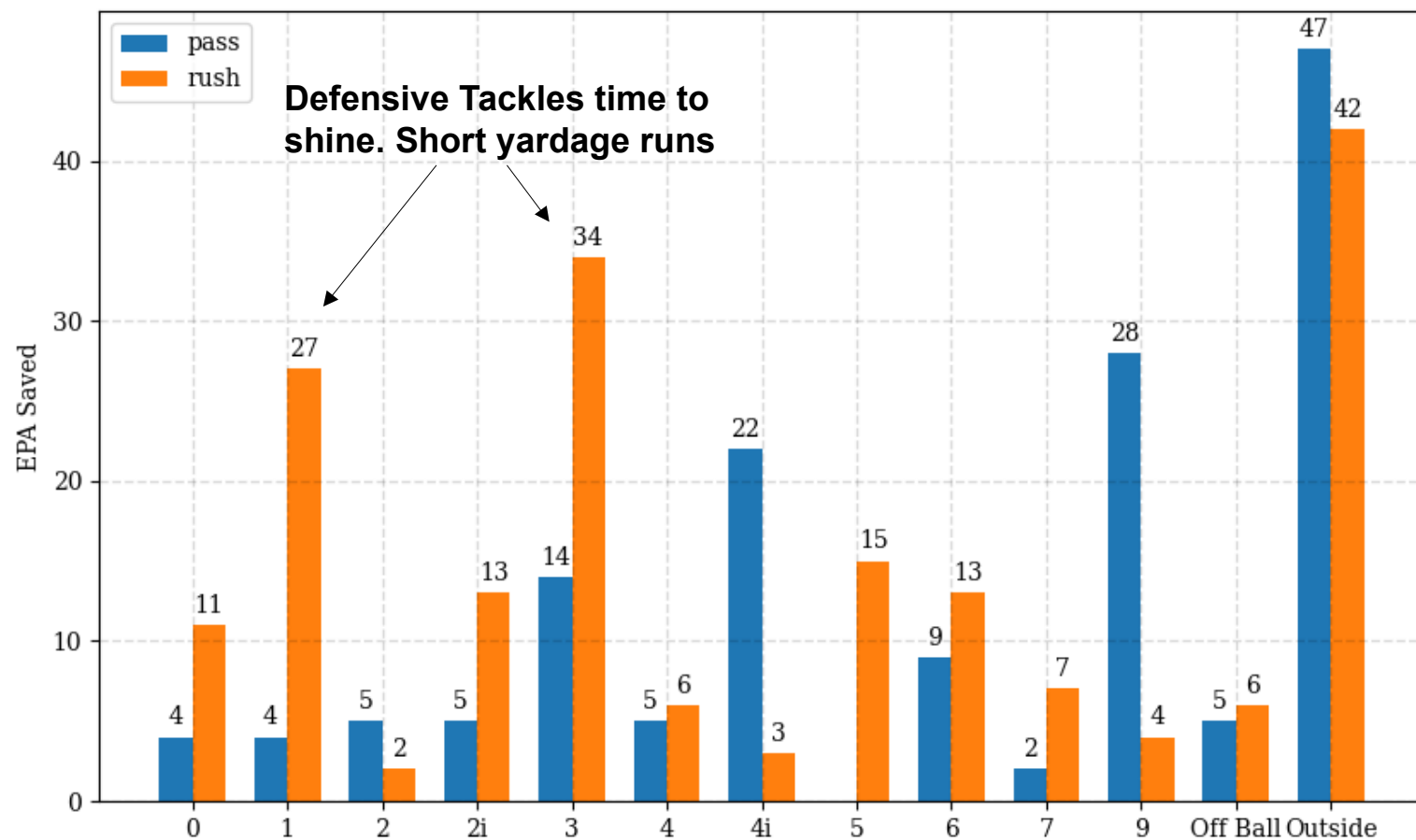


Total EPA saved by Technique and EventType: Cowboys (4-3)

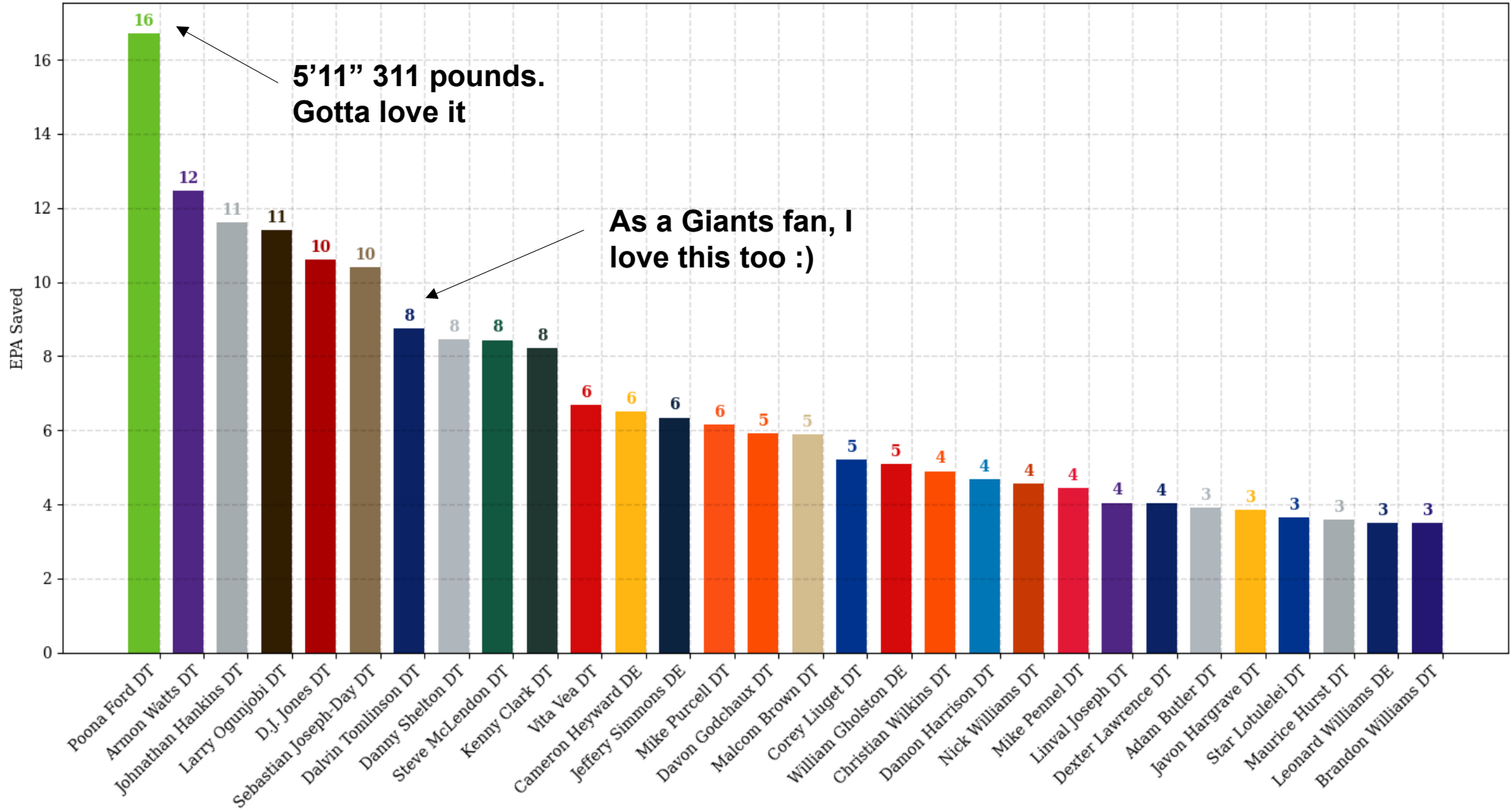


- There are in-game situations where certain positions are more valuable than other. In particular, short yardage run situations. 0-tech and 1-tech defensive tackles are much more important in this situation compared to regular game situations. See the graph on the next page

Total EPA saved when Yards to Go ≤ 2



Total EPA saved by the beef eaters (0-tech and 1-tech only)



This was a fun project. Thanks for putting this together.

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